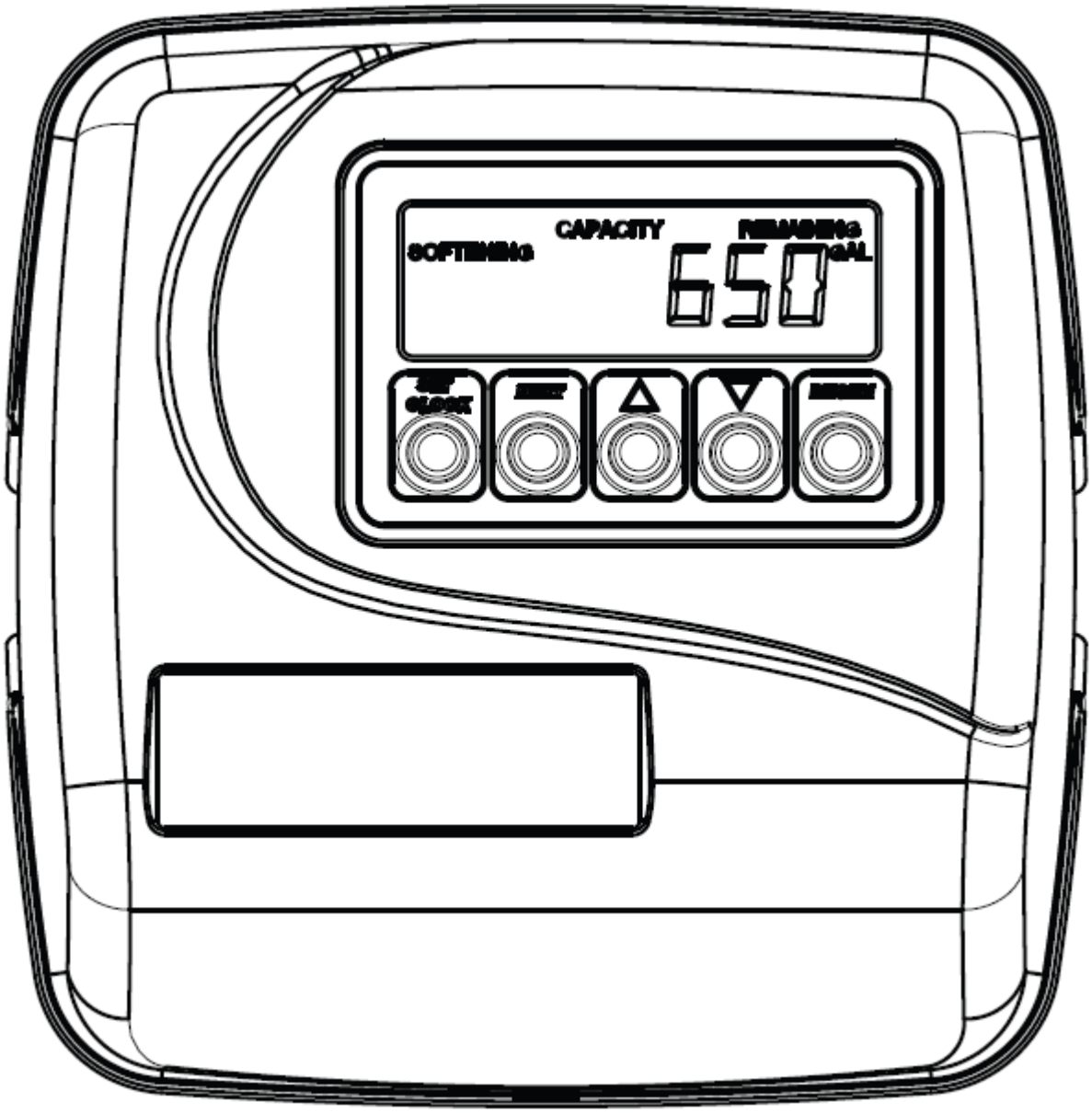
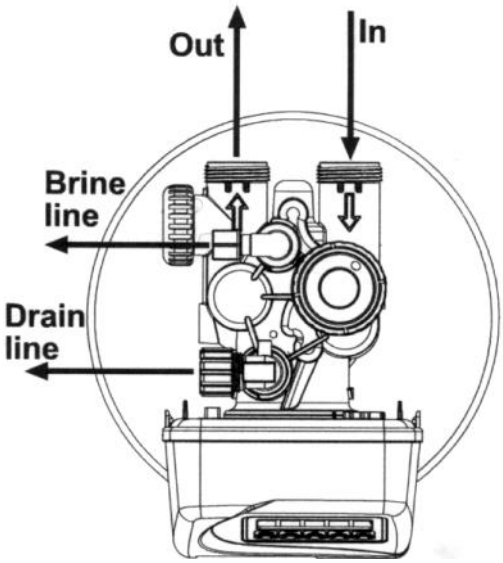
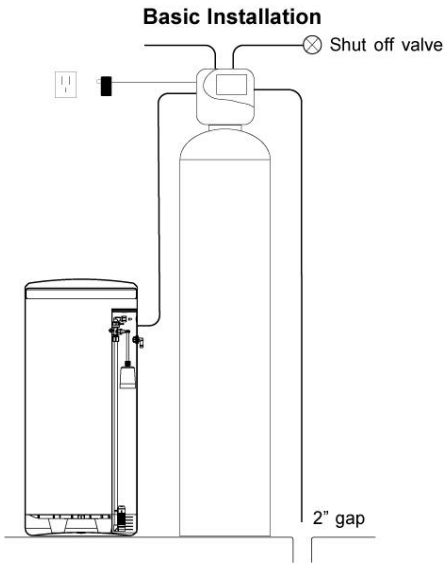


NUGWS1 WATER SOFTENER OWNER'S MANUAL

BASIC INSTALLATION





General installation & Guide

The control valve, fittings and/or bypass are designed to accommodate minor plumbing misalignments but are not designed to support the weight of a system or the plumbing.

Do not use Vaseline, oils, other hydrocarbon lubricants or spray silicone anywhere. A silicone lubricant may be used on black o-rings but is not necessary. Avoid any type of lubricants, including silicone on red or clear lip seals.

Do not use pipe dope or other sealants on threads. Teflon tape must be used on the threads of the 1" connection and on the threads for the drain line connection. Teflon tape is not necessary on the nut connections or cap because o-rings seals are used. The nuts and caps are designed to be tightened by hand or with the special plastic service wrench, #V3193-XXX. If necessary a pliers can be used to unscrew the nut or cap. **Do not** use a pipe wrench. **Do not** place screwdriver in slots on caps and/or tap with a hammer.

1. The distance between the drain and the water softener should be as short as possible. Drain tube/pipe should be a minimum of 5/8" size.
2. All plumbing should be done in accordance with local plumbing codes.
3. Do not install any Water Softener with less than 15 feet of piping between its outlet and the inlet of a water heater.
4. Do not locate unit where it or its connections (including the drain and overflow lines) will ever be subjected to room temperatures under 34F.
5. Inlet/outlet plumbing: connect to a supply line and install an inlet shutoff valve.
6. Drain line: Be sure that the drain can handle the backwash rate of the system and install a flexible plastic tube to the Drain Line Assembly.
7. **Check you water pressure!!! Water pressure exceeding 90 PSI will void your warranty. Install a pressure regulator is your pressure is over 80 PSI.

*****Protect this system from Hot Water Back-feed and from Vacuum. Install a working expansion tank on the inlet line of the water heater, and a vacuum breaker on the piping if this installation is prone to vacuum*****
*****Protect this system from freezing, and from weather exposure and from direct UV exposure. Freezing, weather exposure and UV exposure will void your systems warranty.*****
****Protect this system from high chlorinated and high chloramine water supplies. High levels of chlorine and chloramines in the raw water will damage the water softener resin and components. Install a de-chlorinator system- such as a carbon filter system inline before the water softener to protect the water softener from the chlorine and chloramines.****

Pre-Installation Instructions

The manufacturer has preset the water treatment unit's cycle times, salt dose, exchange capacity and the salt dose refill time.

The dealer should read this page and guide the installer through setting the Hardness, Days Override, and Time of Regeneration prior to installation.

For the installer the following settings should be used:

1. Program Installer Settings
    Hardness (set to local conditions)
    Day Override (factory set to 14)
    Time of Regeneration (preset to 2:00AM)

2. Set Time of Day

For the homeowner, please read user display settings.

Water Softeners:
During operation, the normal user display is time of day or volume remaining. Other displays are available and can be viewed by pressing the NEXT button to scroll through them. When stepping through any programming, if no buttons are pressed within 5 minutes, the display returns to a normal user display. Any changes made prior to the 5 minute time out are incorporated.

To quickly exit any Programming, Installer Settings, etc., press the CLOCK button. Any changes made prior to the exit are incorporated. If desired, two regenerations within 24 hours are possible with a return to the preset program. To do a double regeneration:
1. Press the REGEN button once. "REGEN TODAY" will flash on the display.
2. Press and hold the REGEN button for three seconds until the regeneration begins.

Once the control valve has completed the immediate regeneration it will do another one at the next scheduled regeneration time.

*****Protect this system from Hot Water Back-feed and from Vacuum. Install a working expansion tank on the inlet line of the water heater, and a vacuum breaker on the piping if this installation is prone to vacuum*****
*****Protect this system from freezing, and from weather exposure and from direct UV exposure. Freezing, weather exposure and UV exposure will void your systems warranty.*****

****Protect this system from high chlorinated and high chloramine water supplies. High levels of chlorine and chloramines in the raw water will damage the water softener resin and components. Install a de-chlorinator system- such as a carbon filter system inline before the water softener to protect the water softener from the chlorine and chloramines.****

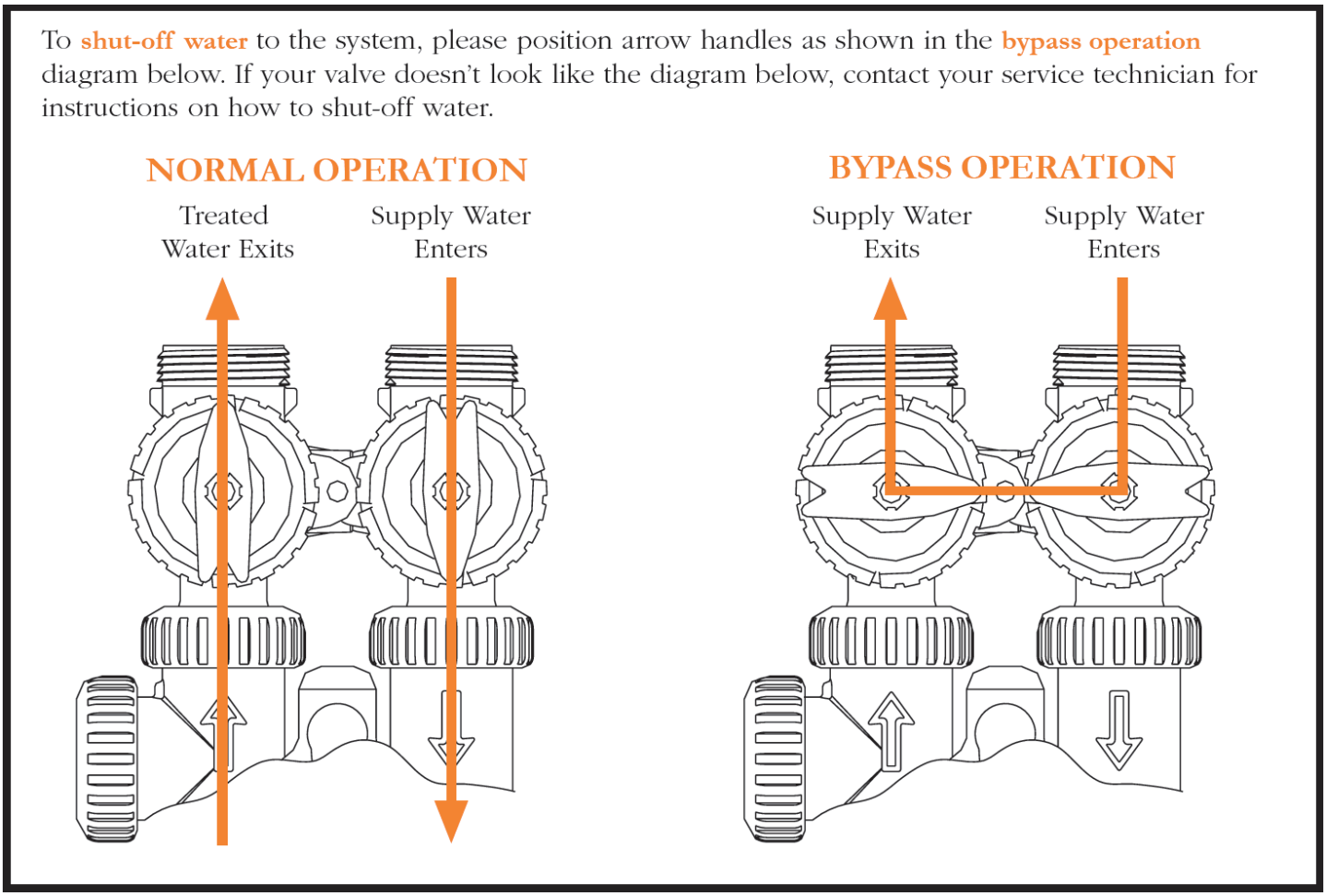
Bypass Valve

The bypass valve is used to isolate the control valve from the plumbing system in order to perform valve repairs or maintenance.

1. **Normal Operation Position:** The inlet and outlet handles point in the direction of flow indicated by the engraved arrows on the control valve.

2. **Bypass Position:** The inlet and outlet handles point to the center of the bypass. Untreated water is supplied to the plumbing system.

To **shut-off water** to the system, please position arrow handles as shown in the **bypass operation** diagram below. If your valve doesn't look like the diagram below, contact your service technician for instructions on how to shut-off water.



Start-up Instructions:

- After installation is completed rotate the bypass handles on the water softener to the bypass position.
- Fully open a cold water faucet in the home & turn water supply back on in the home.
- Allow water to run until clear to rid pipes of debris, which may have occurred during installation.

- **The system is now ready for start-up:**

1. Set Time of Day & Hardness.

TO SET TIME OF DAY

In the event of a prolonged power outage, time of day flashes, indicating that this needs to be reset. All other information will be stored in memory no matter how long the power outage. Please complete the steps as shown to the right. To access this mode, press "SET CLOCK."

1. Accessed by pressing "SET CLOCK."
2. Adjust hours with up and down arrows, AM/PM toggles at 12.
3. Press "NEXT."
4. Adjust minutes with up and down arrows.
5. Press "NEXT" to complete and return to normal operation.

ADJUST HARDNESS, DAYS BETWEEN REGENERATIONS, OR TIME OF REGENERATION

For initial set-up or to make adjustments, please complete the steps as shown to the right. Access this mode by pressing "NEXT" and "Δ" simultaneously. **NOTE:** Hardness display shows "-nA-" if used as a filter. If other displays do not appear, refer to manual.

1. Accessed by pressing "NEXT" and up arrow simultaneously.
2. Adjust hardness using up and down arrows.
3. Press "NEXT."
4. Adjust days between regenerations using up and down arrows.
5. Press "NEXT."
6. Adjust time of regeneration hours with up and down arrows, AM/PM toggles at 12.
7. Press "NEXT."
8. Adjust time of regeneration minutes with up and down arrows.
9. Press "NEXT" to complete and return to normal operation.

V3115-01(4/01)

2. Once time of Day & Hardness are set, follow the below directions.
3. Press and hold the **"REGEN" button for five seconds until the drive motor starts, then release.** Wait until the motor stops running and the display reads **"BACKWASH"**
4. Open the inlet handle of the bypass valve very slowly, ½ way open, allowing water to fill the tank slowly in order to expel air.
5. When the water is flowing steadily to the drain without the presence of air, **fully open** the inlet bypass valve handle & let the water flow to drain for 5 minutes.
6. Press the **"REGEN" button again to advance the control to the next position.** The display will read **"DN BRINE DRAW"**. Press the **"REGEN" button again & release**. The display will now read **"BACKWASH".** Let water run to drain for another 3 minutes, then press the **"REGEN" button again & release.**
7. The display will now read **"RINSE".** Allow water to rinse to drain for 3 minutes.
8. Now press the **"REGEN" button again & release.**
9. The display will now read **"FILL".** Allow water softener to FILL the brine tank on its own.
10. Once the system has filled the brine tank with the proper amount of water, the system will return to the service/home position automatically.
11. Once your system is displaying time of day, slowly open the outlet bypass handle to the fully open position.
12. Your system is now operational and servicing the home.
13. ****Note**** Manually put 2" of water into the empty salt/brine tank during start-up. This will prime the salt tank for the first regeneration. Everything will be automatic after initial start-up.
14. ****Note**** Now add salt to the salt/brine tank. **Note: Always keep the salt/brine tank at least half way full of salt.

Manual Regeneration:

- To manually regenerate your water softener “immediately”, Press & Hold the **“REGEN” button for five seconds**, until you hear the motor start running, then release. This will start your water softener into an “immediate” regeneration.
- To manually regenerate your water softener to a “delayed” regeneration that will occur at the next 2:00AM, press the “REGEN” button one time & release. You will see “REGEN TODAY” flashing on the display & regeneration will occur automatically at 2:00AM.

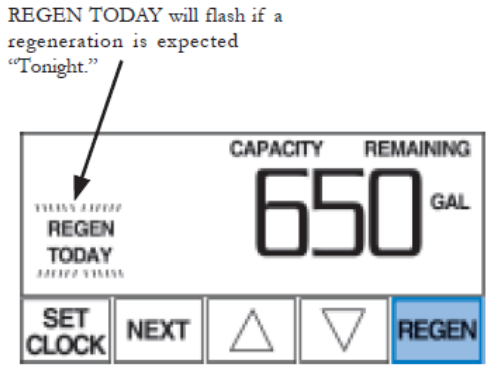
MANUAL REGENERATION

NOTE: For softeners, if brine tank does not contain salt, fill with salt and wait at least 2 hours before regeneration.

If you need to initiate a manual regeneration, either immediately, or tonight at the preprogrammed time for regeneration (typically 2:00 AM), complete the following steps.

For Immediate Regeneration:
Press and hold “REGEN” until valve motor starts (typically 3 seconds).

For Regeneration Tonight:
Press and release “REGEN” (notice that flashing “REGEN TODAY” appears).



System Regeneration Cycle Steps:

- **When your water softener system is in a regeneration, the following cycles have been set by the manufacture.**

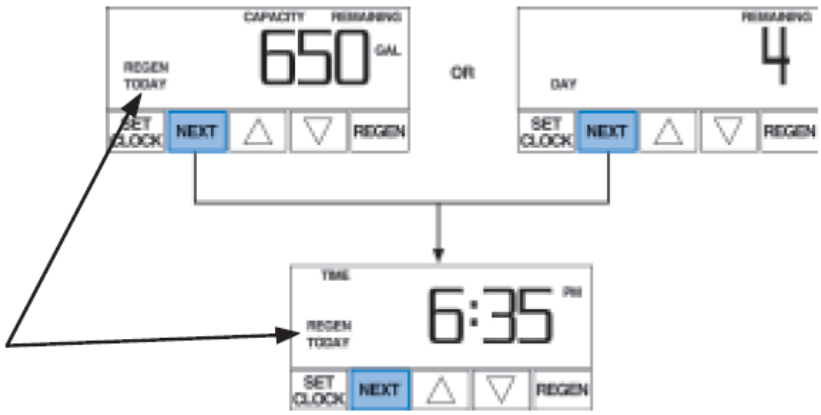
1- **BACKWASH (**This cycle will backwash the resin & prepare the resin for brining)
2- **BRINE DRAW** (This cycle will draw the brine water from the salt/brine tank & slowly rinse it through the water softener resin, cleaning the resin & regenerating the resin)
3- **2nd BACKWASH** (This cycle will evenly backwash the freshly brined resin)
4- **RINSE (**This cycle will rinse & flush the water softener resin to remove any excess brine off of the resin).
5- **FILL** (fills the brine tank for the next regeneration)

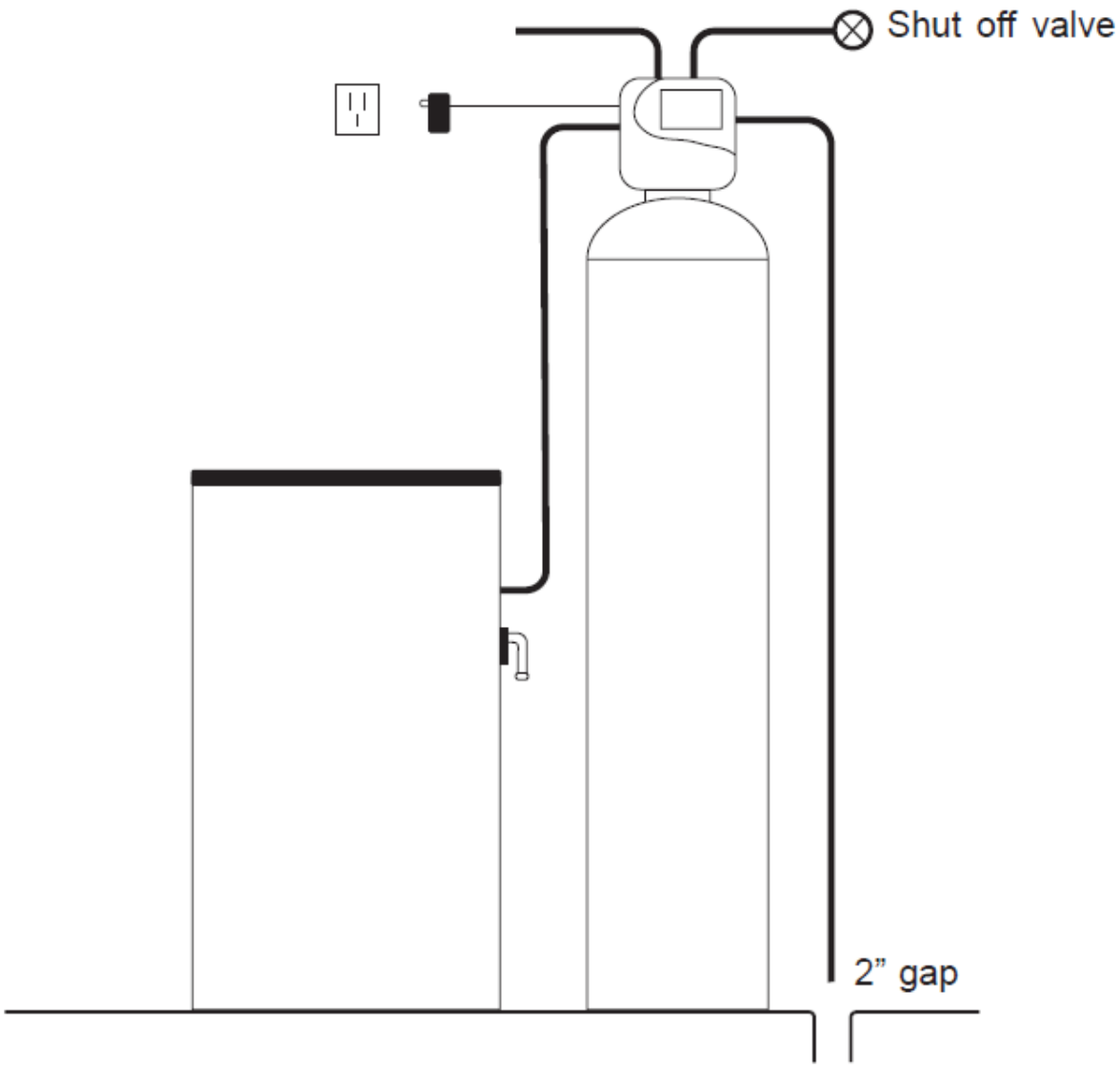
General Operation:

GENERAL OPERATION

When the system is operating one of two displays will be shown. Time of day will be one choice, gallons of treated water available or days until the next regeneration will be the other choice. Pressing "NEXT" will toggle between the two choices.

REGEN TODAY will show if a regeneration is expected "Tonight."





BYPASS VALVE OPERATION

Figure 1

NORMAL OPERATION

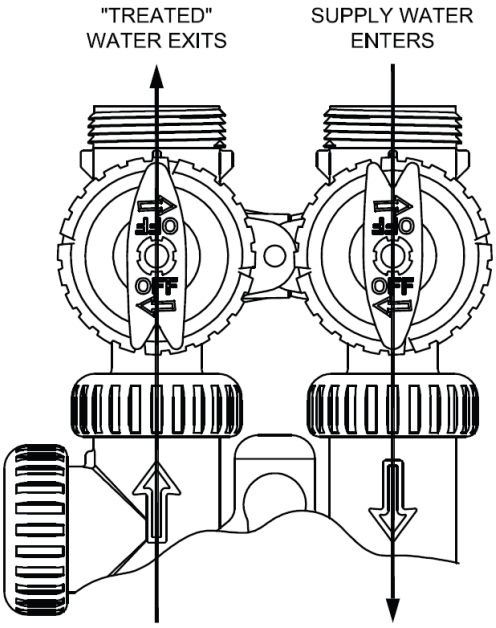


Figure 2

BYPASS OPERATION

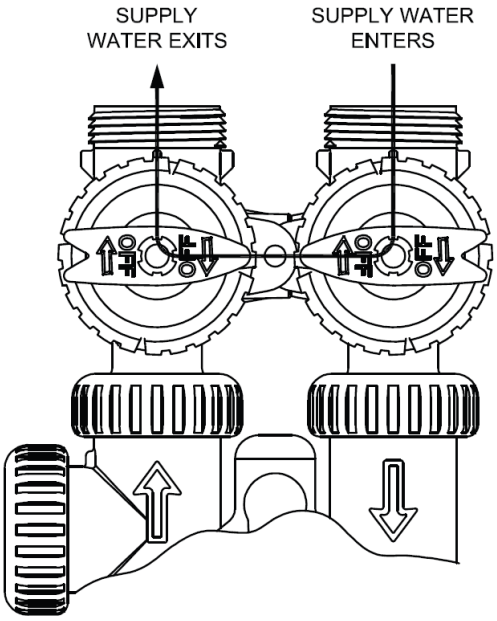


Figure 3

DIAGNOSTIC MODE

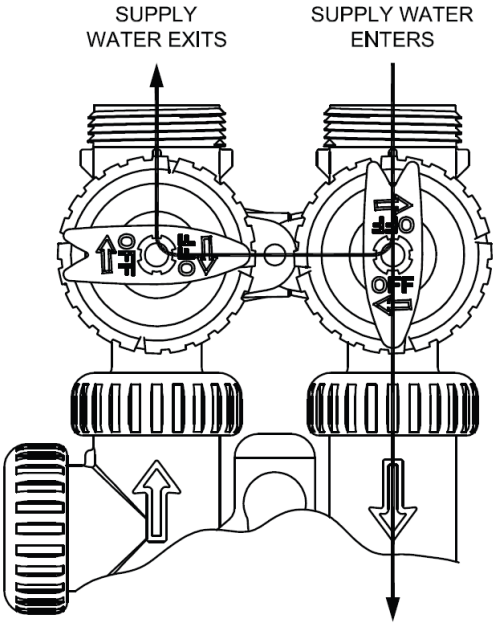
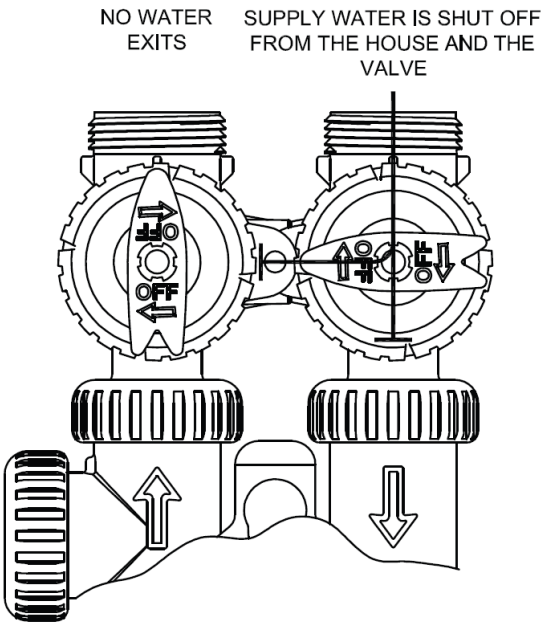
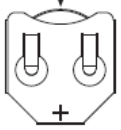


Figure 4

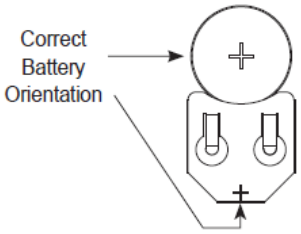
SHUT OFF MODE

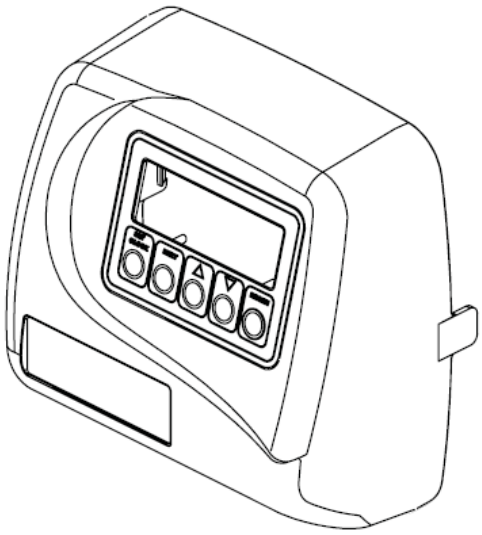


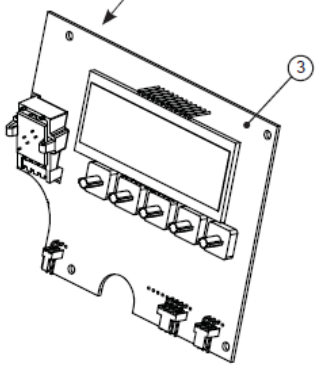
When replacing the battery, align positives and push down to fully seat.

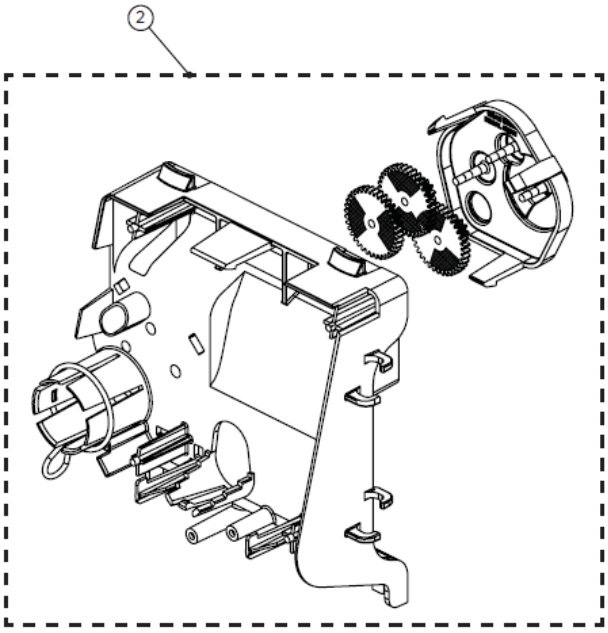


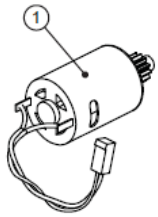
Battery Fully Seated





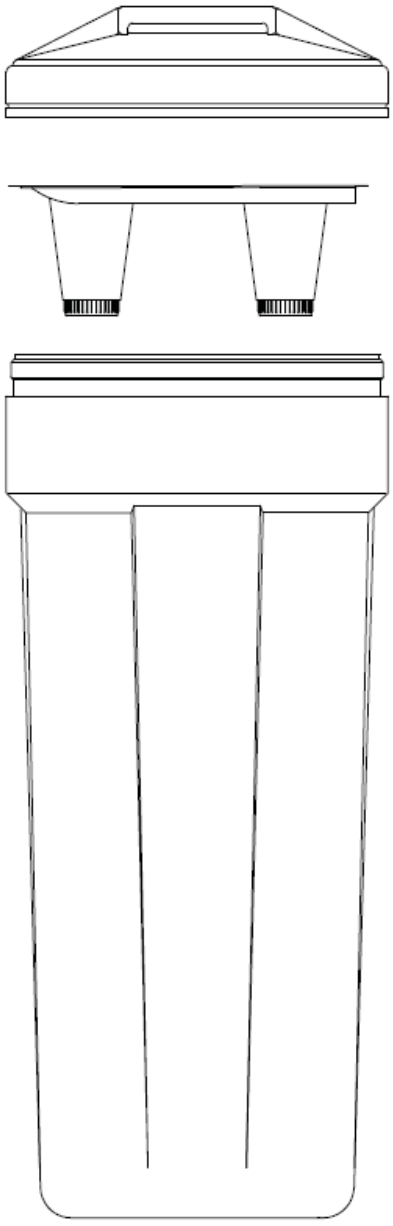


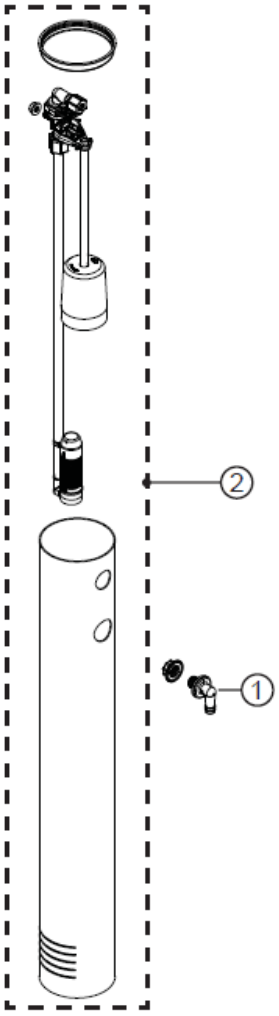




Brine Tank Assembly 14 x 14

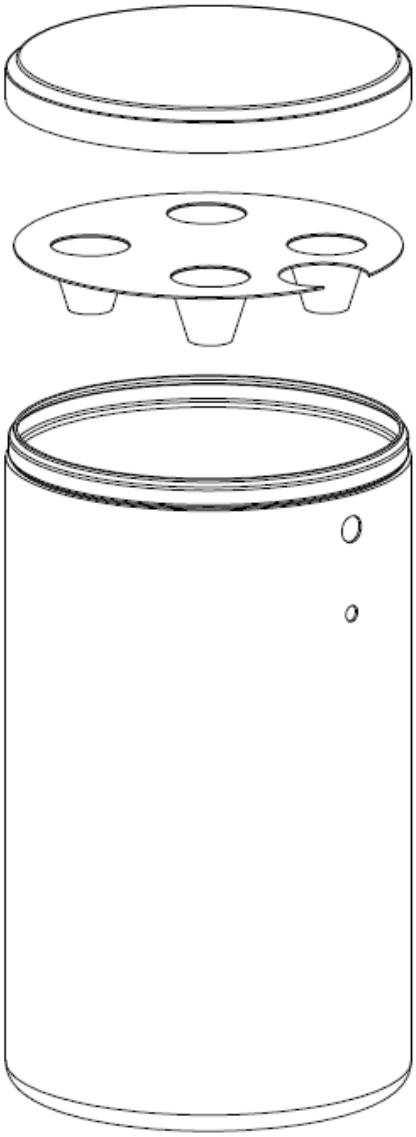
Item No.	Part No.	Description	Qty.
1	BTP-OVERFLOW	2 PIECE OVERFLOW SET	1
2	BTP-474 ASSY 4-30"	BRINE FLOAT ASSY 474-30	1

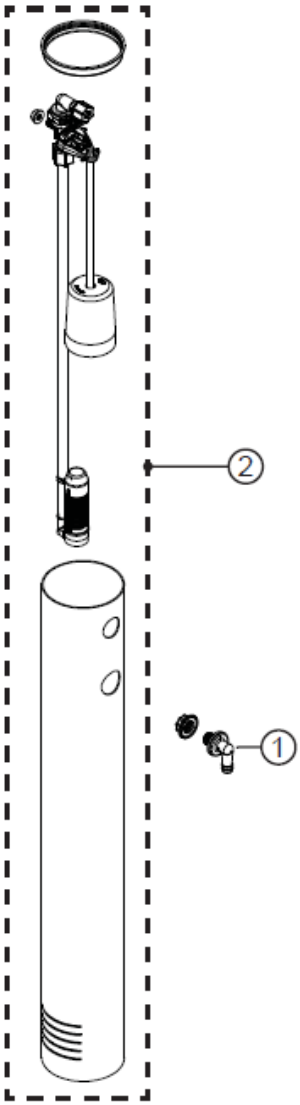




Brine Tank Assembly 18 x 40

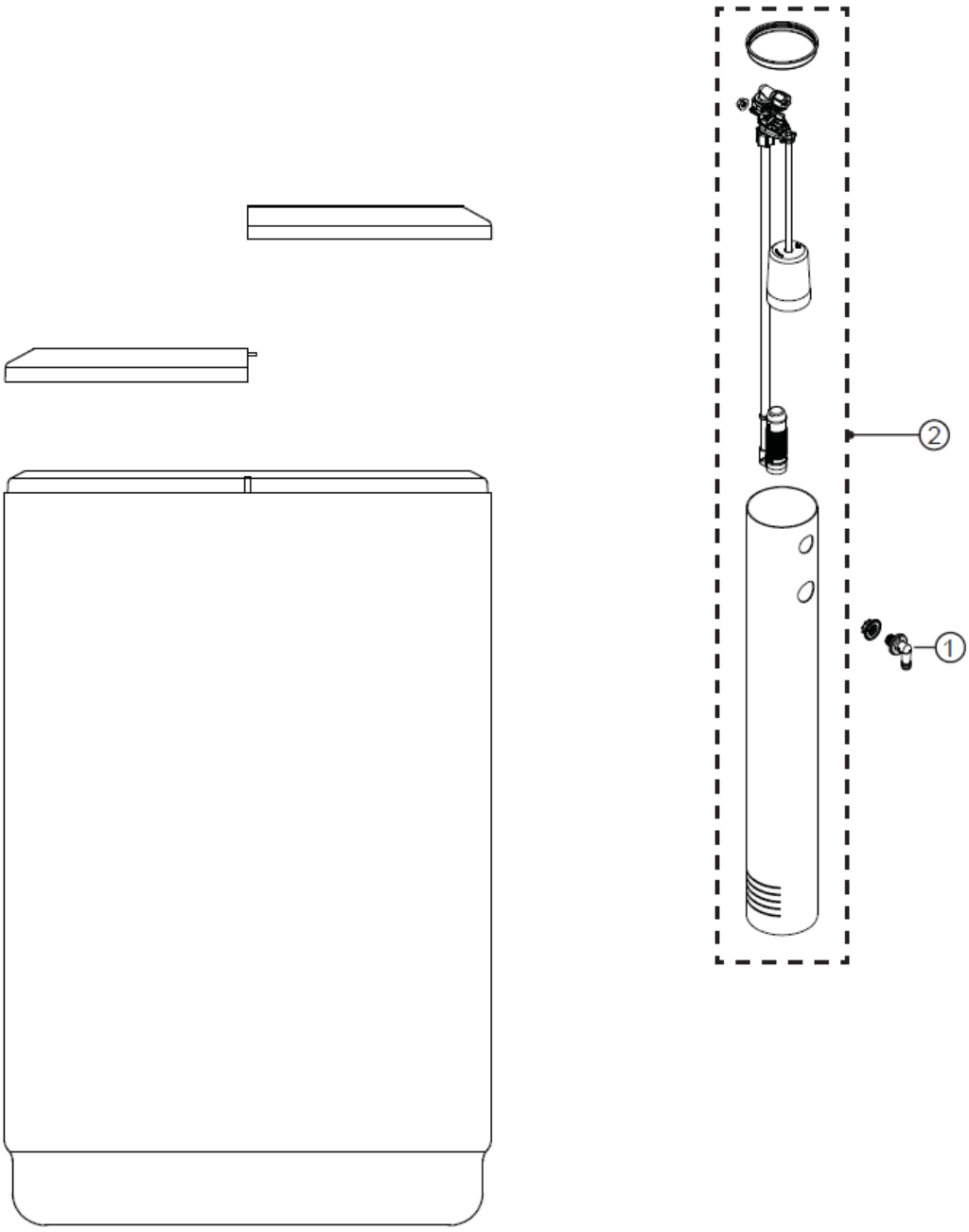
Item No.	Part No.	Description	Qty.
1	BTP-OVERFLOW	2 PIECE OVERFLOW SET	1
2	BTP-474 ASSY 4-36"	BRINE FLOAT ASSY 474-36	1





Cabinet Assembly

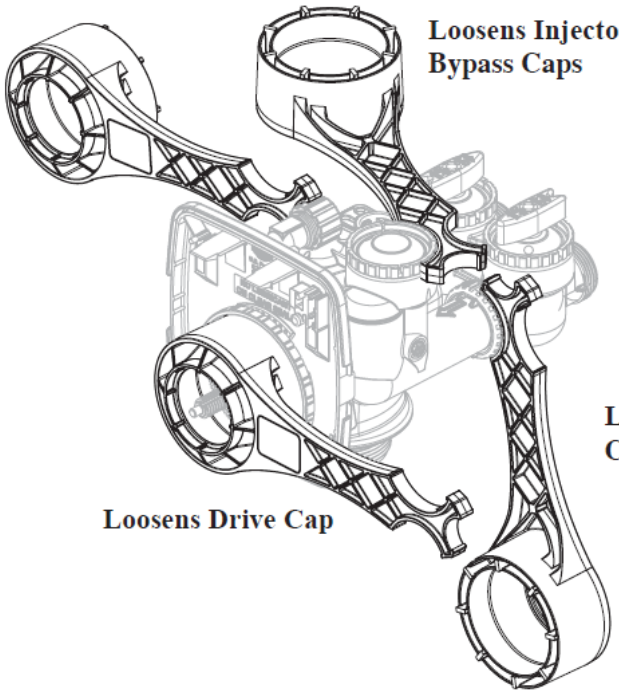
Item No.	Part No.	Description	Qty.
1	BTP-OVERFLOW	2 PIECE OVERFLOW SET	1
2	BTP-474 ASSY 4-30"	BRINE FLOAT ASSY 474-30	1



Service Wrench - CV-P-V3193-02

Not provided with system. Separate purchase required. Bypass and depressurize system before using wrench.

Loosens Drain Nut in Polytube Applications



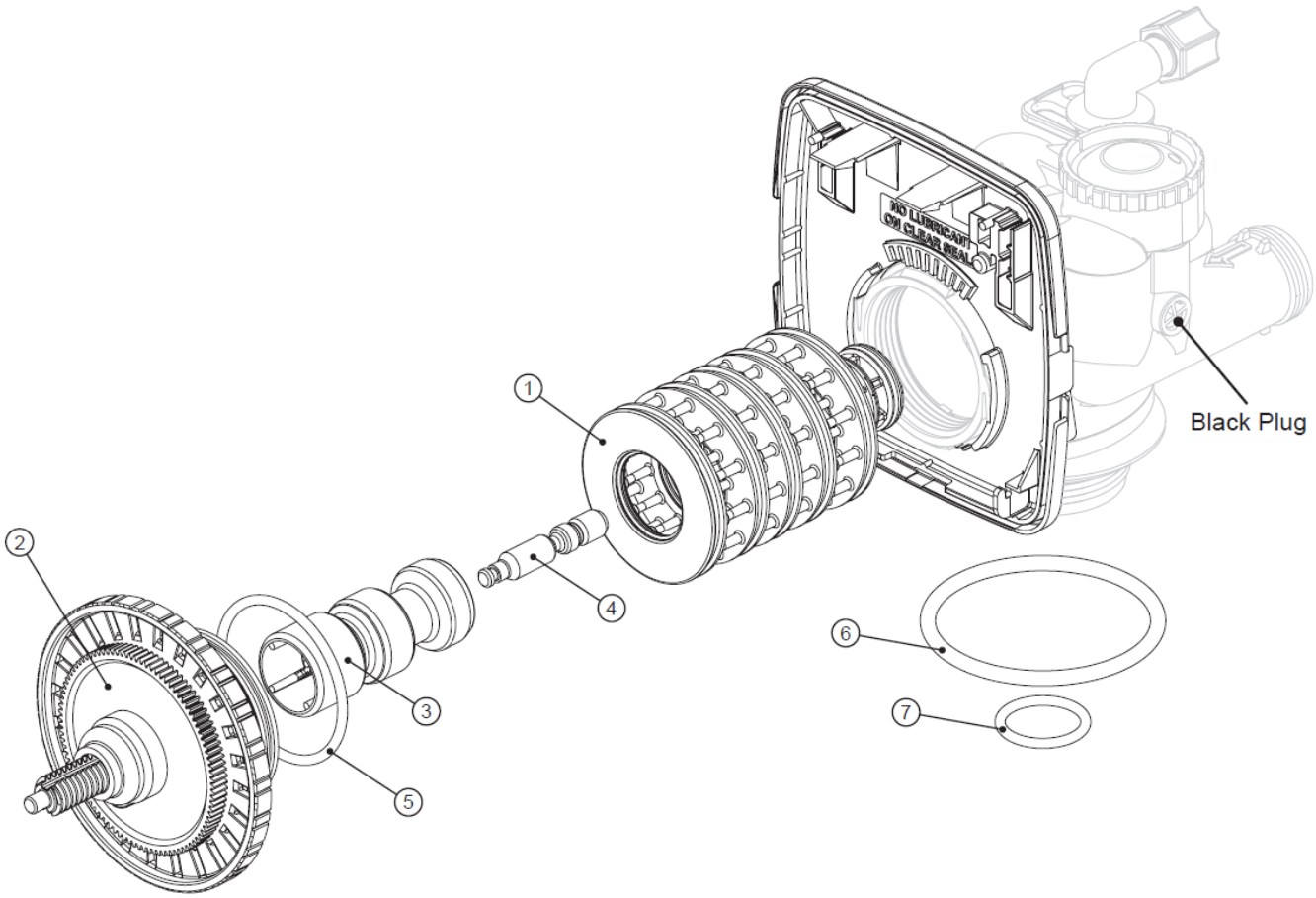
Loosens Injector And Bypass Caps

Although no tools are necessary to assemble or disassemble the valve, the Service Wrench, (shown in various positions on the valve) is available to aid in assembly or disassembly.

Loosens Quick Connect Nuts

Loosens Drive Cap

Drawing No.	Order No.	Description	Quantity
1	CV-P-V3005	Spacer Stack Assembly	1
2	CV-P-V3004	Drive Cap ASY	1
3	CV-P-V3011	Piston Downflow ASY	1
4	CV-P-V3174	Regenerant Piston	1
5	CV-P-V3135	O-ring 228	1
6	CV-P-V3180	O-ring 337	1
7	CV-P-V3105	O-ring 215 (Distributor Tube)	1



Troubleshooting

Problem	Possible Cause	Solution
1. No Display on PC Board	a. No power at electric outlet	a. Repair outlet or use working outlet
	b. Control valve Power Adapter not plugged into outlet or power cord end not connected to PC board connection	b. Plug Power Adapter into outlet or connect power cord end to PC Board connection
	c. Improper power supply	c. Verify proper voltage is being delivered to PC Board
	d. Defective Power Adapter	d. Replace Power Adapter
	e. Defective PC Board	e. Replace PC Board
2. PC Board does not display correct time of day	a. Power Adapter plugged into electric outlet controlled by light switch	a. Use uninterrupted outlet
	b. Tripped breaker switch and/or tripped GFI	b. Reset breaker switch and/ or GFI switch
	c. Power outage	c. Reset time of day. If PC Board has battery back up present the battery may be depleted. See Front Cover and Drive Assembly drawing for instructions.
	d. Defective PC Board	d. Replace PC Board
3. Display does not indicate that water is flowing. Refer to user instructions for how the display indicates water is flowing	a. Bypass valve in bypass position	a. Turn bypass handles to place bypass in service position
	b. Meter is not connected to meter connection on PC Board	b. Connect meter to three pin connection labeled METER on PC Board
	c. Restricted/ stalled meter turbine	c. Remove meter and check for rotation or foreign material
	d. Meter wire not installed securely into three pin connector	d. Verify meter cable wires are installed securely into three pin connector labeled METER
	e. Defective meter	e. Replace meter
	f. Defective PC Board	f. Replace PC Board
4. Control valve regenerates at wrong time of day	a. Power outage	a. Reset time of day. If PC Board has battery back up present the battery may be depleted. See Front Cover and Drive Assembly drawing for instructions.
	b. Time of day not set correctly	b. Reset to correct time of day
	c. Time of regeneration set incorrectly	c. Reset regeneration time
	d. Control valve set at "on 0" (immediate regeneration)	d. Check programming setting and reset to NORMAL (for a delayed regen time)
	e. Control valve set at "NORMAL + on 0" (delayed and/ or immediate)	e. Check programming setting and reset to NORMAL (for a delayed regen time)
5. Time of day flashes on and off	a. Power outage	a. Reset time of day. If PC Board has battery back up present the battery may be depleted. See Front Cover and Drive Assembly drawing for instructions.
6. Control valve does not regenerate automatically when the REGEN button is depressed and held.	a. Broken drive gear or drive cap assembly	a. Replace drive gear or drive cap assembly
	b. Broken Piston Rod	b. Replace piston rod
	c. Defective PC Board	c. Defective PC Board
7. Control valve does not regenerate automatically but **does** when the REGEN button is depressed and held.	a. Bypass valve in bypass position	a. Turn bypass handles to place bypass in service position
	b. Meter is not connected to meter connection on PC Board	b. Connect meter to three pin connection labeled METER on PC Board
	c. Restricted/ stalled meter turbine	c. Remove meter and check for rotation or foreign material
	d. Incorrect programming	d. Check for programming error
	e. Meter wire not installed securely into three pin connector	e. Verify meter cable wires are installed securely into three pin connector labeled METER
	f. Defective meter	f. Replace meter
	g. Defective PC Board	g. Replace PC Board

Problem	Possible Cause	Solution
8. Hard or untreated water is being delivered	a. Bypass valve is open or faulty	a. Fully close bypass valve or replace
	b. Media is exhausted due to high water usage	b. Check program settings or diagnostics for abnormal water usage
	c. Meter not registering	c. Remove meter and check for rotation or foreign material
	d. Water quality fluctuation	d. Test water and adjust program values accordingly
	e. No regenerant or low level of regenerant in regenerant tank	e. Add proper regenerant to tank
	f. Control fails to draw in regenerant	f. Refer to Trouble Shooting Guide number 12
	g. Insufficient regenerant level in regenerant tank	g. Check refill setting in programming. Check refill flow control for restrictions or debris and clean or replace
	h. Damaged seal/stack assembly	h. Replace seal/stack assembly
	i. Control valve body type and piston type mix matched	i. Verify proper control valve body type and piston type match
	j. Fouled media bed	j. Replace media bed
9. Control valve uses too much regenerant	a. Improper refill setting	a. Check refill setting
	b. Improper program settings	b. Check program setting to make sure they are specific to the water quality and application needs
	c. Control valve regenerates frequently	c. Check for leaking fixtures that may be exhausting capacity or system is undersized
10. Residual regenerant being delivered to service	a. Low water pressure	a. Check incoming water pressure – water pressure must remain at minimum of 25 psi
	b. Incorrect injector size	b. Replace injector with correct size for the application
	c. Restricted drain line	c. Check drain line for restrictions or debris and clean
11. Excessive water in regenerant tank	a. Improper program settings	a. Check refill setting
	b. Plugged injector	b. Remove injector and clean or replace
	c. Drive cap assembly not tightened in properly	c. Re-tighten the drive cap assembly
	d. Damaged seal/ stack assembly	d. Replace seal/ stack
	e. Restricted or kinked drain line	e. Check drain line for restrictions or debris and or un-kink drain line
	f. Plugged backwash flow controller	f. Remove backwash flow controller and clean or replace
	g. Missing refill flow controller	g. Replace refill flow controller
12. Control valve fails to draw in regenerant	a. Injector is plugged	a. Remove injector and clean or replace
	b. Faulty regenerant piston	b. Replace regenerant piston
	c. Regenerant line connection leak	c. Inspect regenerant line for air leak
	d. Drain line restriction or debris cause excess back pressure	d. Inspect drain line and clean to correct restriction
	e. Drain line too long or too high	e. Shorten length and or height
	f. Low water pressure	f. Check incoming water pressure – water pressure must remain at minimum of 25 psi

Problem	Possible Cause	Solution
13. Water running to drain	a. Power outage during regeneration	a. Upon power being restored control will finish the remaining regeneration time. Reset time of day.
	b. Damaged seal/ stack assembly	b. Replace seal/ stack assembly
	c. Piston assembly failure	c. Replace piston assembly
	d. Drive cap assembly not tightened in properly	d. Re-tighten the drive cap assembly
14. E1, Err – 1001, Err – 101 = Control unable to sense motor movement	a. Motor not inserted full to engage pinion, motor wires broken or disconnected	a. Disconnect power, make sure motor is fully engaged, check for broken wires, make sure two pin connector on motor is connected to the two pin connection on the PC Board labeled MOTOR. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	b. PC Board not properly snapped into drive bracket	b. Properly snap PC Board into drive bracket and then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	c. Missing reduction gears	c. Replace missing gears
15. E2, Err – 1002, Err – 102 = Control valve motor ran too short and was unable to find the next cycle position and stalled	a. Foreign material is lodged in control valve	a. Open up control valve and pull out piston assembly and seal/ stack assembly for inspection. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	b. Mechanical binding	b. Check piston and seal/ stack assembly, check reduction gears, check drive bracket and main drive gear interface. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	c. Main drive gear too tight	c. Loosen main drive gear. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	d. Improper voltage being delivered to PC Board	d. Verify that proper voltage is being supplied. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.

Problem	Possible Cause	Solution
16. E3, Err – 1003, Err – 103 = Control valve motor ran too long and was unable to find the next cycle position	a. Motor failure during a regeneration	a. Check motor connections then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	b. Foreign matter built up on piston and stack assemblies creating friction and drag enough to time out motor	b. Replace piston and stack assemblies. Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
	c. Drive bracket not snapped in properly and out enough that reduction gears and drive gear do not interface	c. Snap drive bracket in properly then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.
17. Err – 1004, Err – 104 = Control valve motor ran too long and timed out trying to reach home position	a. Drive bracket not snapped in properly and out enough that reduction gears and drive gear do not interface	a. Snap drive bracket in properly then Press NEXT and REGEN buttons for 3 seconds to resynchronize software with piston position or disconnect power supply from PC Board for 5 seconds and then reconnect.